

What is claimed:

1. A system for monitoring performance of a position determination of a mobile communication terminal
5 by using a wireless network and an A(Assisted)-GPS, the system comprising:

the mobile communication terminal equipped with a GPS module for picking up GPS radio wave containing a navigation data from a GPS satellite and transmitting the
10 navigation data to the wireless network;

a test device, connected to the mobile communication terminal through wired/radio link, for being loaded with and running a LBS wireless network analysis program, wherein the LBS wireless network analysis program gathers,
15 analyzes and processes data pertinent to the position determination and classifies processed data by at least one classification reference and displays classified data in the format of text or graph; and

a position determination server for receiving the
20 navigation data from the wireless network, converting the navigation data into longitude and latitude coordinate

values, transmitting the longitude and latitude coordinate values to the mobile communication terminal and performs transmission and reception of the data pertinent to the position determination.

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2. The system of claim 1, wherein the data pertinent to the position determination is a LBS message that the mobile communication terminal acquires from the position determination server, the LBS message being
10 defined in the IS-801-1 standard.

3. The system of claim 2, wherein the LBS wireless network communication network analyzes the LBS message and consequently indicates the time information of transmission
15 or reception of the LBS message, the name of the LBS message, and a type of message, wherein the type of message is whether the LBS message is a forward channel message, a reverse channel message, a request message or a response message.

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4. The system of claim 3, wherein the name of the LBS message is one of "Request MS Information", "Request Pilot Phase Measurement", "Provide MS Information", "Provide Pilot Phase Measurement", "Request Pseudorange Measurement", "Provide Pseudorange Measurement", "Provide GPS Acquisition Assistance", "Provide GPS Sensitivity Assistance", "Request Location response".

5. The system of claim 1 or 2, wherein the LBS wireless network analysis program analyzes and displays information on the GPS satellite, wherein the information on the GPS satellites is more than one out of an azimuth angle, an elevation angle, a total number of the GPS satellites and an identification number of each satellite included in a "Provide GPS Acquisition" message.

6. The system of claim 1 or 2, wherein the LBS wireless communication analysis program analyzes and displays information on the GPS satellite, wherein the information on the GPS satellite is more than one out of a total number of the GPS satellites and an identification

number of each satellite included in a "Provide Pseudorange Measurement" message.

7. The system of claim 2, wherein the LBS wireless
5 communication analysis program extracts and displays
information on the wireless network, a pseudo random noise
code of a radio base station which transmits the LBS
message and strength of the pseudo random noise code, from
the LBS message.

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8. The system of claim 7, wherein the wireless
network is one out of a CDMA(Code Division multiple
Access), GSM(Global system for Mobile communication),
CDMA2000 1X, 3X, EV-DO, EV-DV, WCDMA(Wideband CDMA) and
15 PI(Portable Internet).

9. The system of claim 1, wherein the mobile
communication terminal communicates with the test device
through an infra-red communication link, Bluetooth
20 communication link or a radio frequency link.

10. The system of claim 1, wherein the mobile communication terminal exchanges the data pertinent to the position determination with the position determination server through a TCP/IP(Transmission Control Protocol/Internet Protocol) link.

11. The system of claim 1, wherein the mobile communication terminal is one out of a PDA, a cellular phone, a PCS(Personal Communication Service) phone, a hand-held PC, a GSM(Global System for Mobile) phone, a W-CDMA phone, an EV-DO phone and a MBS(Mobile Broadband System) phone.

12. A method for monitoring performance of position determination of a mobile communication terminal in a communication system including a mobile communication terminal picking up GPS radio wave and receiving LBS messages, a test device communicating with the mobile communication terminal and a position determination server performs transmission and reception of the LBS messages, the method comprising the steps of:

(a) receiving the LBS messages on a real time basis from the mobile communication terminal;

(b) analyzing received LBS messages on a real time basis; and

(c) processing analyzed LBS messages into a requested format and displaying converted LBS messages in
5 the format of text or graph.

13. The method of claim 12, wherein the LBS messages are messages defined in IS-801-1 standard.

10 14. The method of claim 12, wherein at step (a), the test device acquires the LBS messages from the mobile communication terminal through wired and/or radio link.

15 15. The method of claim 12, wherein the receiving, analyzing, processing and displaying are preformed by a LBS wireless network analysis program loaded in the test device.

20 16. A computer readable storage medium storing a LBS(Location Based Service) wireless network analysis program receiving, analyzing, processing and displaying LBS messages defined in IP-801-1 standard by using a wireless network and an A(Assisted)-GPS(Global Positioning System),

wherein the LBS wireless network analysis program, coded in a computer language, performs analyzing the LBS messages, displays analyzed LBS messages, and processes and displays information on the wireless network, information on GPS
5 satellite and measured coordinate values included in the LBS messages in text and/or image format.

17. The computer readable storage medium of claim 17, wherein the LBS wireless network analysis program displays
10 the time information of transmission or reception of the LBS message, the name of the LBS message, and a type of message, wherein the type of message is whether the LBS message is a forward channel message, a reverse channel message, a request message or a response message.

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18. The storage medium of claim 17, wherein the name of the LBS message is one of "Request MS Information", "Request Pilot Phase Measurement", "Provide MS Information", "Provide Pilot Phase Measurement", "Request Pseudorange
20 Measurement", "Provide Pseudorange Measurement", "Provide GPS Acquisition Assistance", "Provide GPS Sensitivity Assistance", "Request Location response".

19. The storage medium of claim 17, the information on the wireless network is at least one out of a kind of the wireless network processing the LBS messages, a pseudo random noise code of a radio base station and strength of
5 the pseudo random noise code.

20. The storage medium of claim 19, wherein the wireless network is at least one out of a CDMA(Code Division multiple Access), GSM(Global system for Mobile
10 communication), CDMA2000 1X, 3X, EV-DO, EV-DV, WCDMA(Wideband CDMA) and PI(Portable Internet).

21. The storage medium of claim 19, wherein the information on the GPS satellite is more than one out of an
15 azimuth angle, an elevation angle, a total number of the GPS satellites and an identification number of each satellite, included in a "Provide GPS Acquisition Assistance" message.

22. The storage medium of claim 16, wherein the
20 information on GPS satellite is at least one out of a total number of the GPS satellites and an identification number of each satellite.

23. The storage medium of claim 21 or 22, wherein each of the information on GPS satellite is distinctively indicated with different color, text or pattern on a screen displaying more than one concentric circles and 4 directional intersections, the concentric circles consecutively indicating angles ranging from 0 degree to 90 degrees.

24. The storage medium of claim 18, wherein the LBS wireless network analysis program displays the identification number of each satellite and C/No(Carrier to Noise) on a planar coordinates, both being included in the "Provide Pseudorange Measurement" message, wherein the C/No represents a reception sensitivity of the GPS radio wave.

25. The storage medium of claim 16, wherein the LBS wireless network analysis program stores therein a map data and displays the measured coordinate values as a point as well as a map around the point.

26. The storage medium of claim 25, wherein the map data is made in the format of WGS(World Geodetic System)-84.

27. The storage medium of claim 25, wherein the LBS wireless network analysis program is capable of zooming in or zooming out the map with the reference of the concentric circles or the 4 directional intersections and displaying
5 the map zoomed in or zoomed out.

28. The storage medium of claim 25, wherein the LBS wireless network analysis program supports both a fixed reference mode and a moving reference mode, wherein the
10 fixed reference mode refers to a map display method that the measured position is indicated while the position of a mobile communication terminal is fixed at a certain point, while the moving reference mode refers to another map display method that the measured position is indicated while
15 the position of the mobile communication terminal is moving about on the map.

29. The storage medium of claim 16, wherein the LBS wireless network analysis program displays a position error
20 sequentially on a real time basis, the position error representing a difference between the measured coordinate values and a true position.

30. The storage medium of claim 29, wherein a scale of the position error is adjustable.

31. The storage medium of claim 29, wherein the LBS
5 wireless network analysis program assesses and displays the number of total measurements; the number of measurements having position error within a prescribed range of radius when counting from the least position error among the total measured points.

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32. The storage medium of claim 31, wherein the LBS wireless network analysis program is capable of calculating and displaying a "bias east" or "bias north", wherein the bias east can be an average horizontal component of the
15 position errors and the bias north may be an average vertical component of the position errors.

33. The storage medium of claim 16, wherein the storage medium is one out of a floppy disc, a hard disc, a
20 ZIP disc, a JAZ disc, a compact disc and a DVD(Digital Versatile Disc).